UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,386	04/04/2006	Takeshi Azami	Q92765	1026

23373 7590 11/12/2008
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
POLYANSKY, ALEXANDER	

ART UNIT	PAPER NUMBER
4181	

MAIL DATE	DELIVERY MODE
11/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,386	AZAMI ET AL.	
	Examiner	Art Unit	
	ALEXANDER POLYANSKY	4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/3/07 and 2/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of an Application

Claims 1-14 are pending and presented for examination on merit.

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10/568386, filed on 4/4/06.

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

1. Claims 5-7 and 12-14 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claims 4 and 11. See MPEP § 608.01(n). Multiple dependent claims should not be a basis for another multiple dependent claims. For the examination purpose, claims 5-7 will be interpreted as being dependent on claim 2, and claims 11-14 will be interpreted as being dependent on claim 9.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 7-11, 13, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Iijima et al.

As per claims 1 and 2, Iijima teaches a graphite target holding unit, a light source which irradiates on graphite target; and a recovery unit to collect the nano-carbons obtained from the irradiation; and rotation of the target by frictional force (see abstract and experimental paragraphs 1-3).

As per claims 7-11, 13-14, Iijima teaches a method of nano horn assembly by irradiating light (see abstract); recovering the plume with nano-carbon particles in it (paragraph 3 of the experimental); rotating the graphite target around a central axis while the light irradiated the entire surface of the target (paragraph 2 of the experimental); the irradiating light is a laser beam; and the recovered nano-carbon assemblies are nano horns (see abstract).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 3-4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iijima et al., "Nano-aggregates of single-walled graphitic carbon nano-horns" in view of Makoto et al., JP 2000-249540.

Iijima's process is delineated in the 102 rejection above.

With respect to claim 3, Iijima does not expressly teach the target area has two cylindrical rollers which have a rotation axes substantially parallel to central axis of the graphite target; and '540 does not expressly teach the graphite target is rotated by the friction force between it and the rollers.

However, in a process similar to Iijima, Makoto teaches a target holding unit that has two cylindrical rollers rotating in parallel with the target (see claim 5), and the target rotates about its' axis by the force of friction generated between it and the rollers (see paragraph [0008], and fig. 2).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Iijima including the use of friction rollers in view of the

teaching of Makoto. The suggestion or motivation for doing so would have been to stabilize the graphite target; to rotate that target along its' axis so as to maximize the surface area irradiation and to maximize the laser-to-surface contact and therefore maximizing the nano-carbon assembly yield within the holding unit.

As per claim 4, Makoto teaches a device using the friction force of contact surfaces to rotate components (see paragraph [0008], and fig. 2).

As per claim 6, Makoto teaches the rollers are comprised of hard metallic material (see paragraph 10 of the detailed description).

9. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makoto as applied to claims 3, 4, and 6 above, and further in view of Mineta et al., JP 60-194066.

With respect to claims 5 and 12, Makoto does not expressly teach that the moving unit is configured so as to move the irradiation position while maintaining an irradiation angle of irradiating light substantially constant.

However, in a process similar to Makoto, Mineta teaches an apparatus which can move the irradiated components while maintaining the irradiation angle of light constant (see fig. 4).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Makoto including the movement of friction rollers up or down in view of the teaching of Mineta. The suggestion or motivation for doing so would have been to be able to keep the irradiating unit steady while the graphite target is gradually ascended as it gets smaller and smaller. Also, the motivation to keep a

highly precise roll and perform precision based laser ablation would have been obvious at the time of the invention (Makoto, detailed description paragraphs 4 and 5).

Each critical element of the invention is taught in Iijima combined with Makoto and Mineta. The techniques and skills required for combining all three references use conventional knowledge and are well within the skills of ordinary artisan and thus, are considered obvious. The motivation to combine the three teachings to stabilize the graphite target and to maximize the laser-to-surface contact and therefore maximizing the nano-carbon assembly yield within the holding unit would have been obvious at the time of the invention. Therefore, the claimed subject matter is not patentably distinct over the prior art of the record.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/544400. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instantly claimed invention has a holding unit that spells out rotation by friction whereas '400 does not disclose it in the claims, which in light of the specification, it does provide the definition of the rotation which indeed uses rolling friction. Thus, the scope of claims found in instant application and copending application are substantially overlapping and renders claims obvious to each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 10/555064. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instantly claimed invention has a holding unit that spells out rotation by friction whereas '064 does not disclose it in the claims, which in light of the specification, it does provide a definition of the rotation which indeed uses rolling friction. Thus, the scope of claims found in instant application and copending application are substantially overlapping and renders claims obvious to each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

13. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21-29 of copending Application No. 10/560593. Although the conflicting claims are not identical, they are not patentably distinct from each other. Both instant claims and '053 claims are drawn to an apparatus for forming carbon nanotube. Since the scope of the claimed invention in '593 is more comprehensive to include the first and second pipe leading to the recovery chamber, the scope of the instant claims(broader) are well embraced by '593 claims. Thus, the scope of claims found in instant application and copending application are substantially overlapping and renders claims obvious to each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/556088. Although the conflicting claims are not identical, they are not patentably distinct from each other. Both instant claims and '088 claims are drawn to an apparatus for forming carbon nanotube. Since the scope of the claimed invention in '088 is more comprehensive to include the irradiation angle of a laser beam emitted by the laser beam source, the state of art readily recognizes that the instantly claimed invention describes the angle of incidence in a similar manner. Thus, the scope of claims found in instant application and copending application are substantially overlapping and renders claims obvious to each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

15. Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of copending Application No. 10/544133. Although the conflicting claims are not identical, they are not patentably distinct from each other. Although the scope is much broader in '133, it is readily apparent to one of ordinary skill in the art that the difference between instant claims and '133 claims is considered to be minor variations, routinely modified within the skills and techniques available in the industry. Thus, the scope of claims found in instant application and copending application are substantially overlapping and renders claims obvious to each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER POLYANSKY whose telephone number is (571)270-5904. The examiner can normally be reached on Monday-Friday, 8:00 a.m. EST - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AP

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4181